

Notice of Allowability

Application No.

10/777,454

Applicant(s)

BEEKMAN, FREDERIK
JOHANNES

Examiner

Faye Boosalis

Art Unit

2884

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to submission of 3 May 2006.
2. ☒ The allowed claim(s) is/are 1,2,4-35,38-54,57-72,74 and 80-100.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

EXAMINER'S STATEMENT OF REASONS FOR ALLOWANCE

Comment on Submissions

1. This communication is responsive to submissions 3 May 2006.

Examiner's Amendment

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with attorney Michael Lasky on 15 May 2006 and on 24 July 2006.

Claims 1, 44, 91, 93, 95, 96, 99 and 100 have been amended as follows:

- 1, line 6. (as viewed from the measuring cavity [or lumen] detection means
- 44, line 4. an axial [axei] axis, a cavity wall which may at least partly surround the measuring cavity
- 74, line 5. animal where, viewed from the [lumen] measuring cavity, detection means D are provided behind the pin
- 91. An apparatus according to claim [3] 2, wherein the distance between neighboring planes is not smaller than 0.03 and preferably 0.05 times the distance between neighboring pinholes within any of such planes.

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- 93. An apparatus according to claim [3] 2, wherein the pitch of the helix is not smaller than 0.03 and preferably 0.05 times the distance between neighboring pinholes on the helix.
- 95. An apparatus according to claim [78] 74, wherein the pitch of the helix is not smaller than 0.03 and preferably 0.05 times the distance between neighboring pinholes on the helix.
- 96, line 3. which apparatus comprises a measuring cavity which may have an axial [axei] axis, a cavity
- 99, line 6. viewed from the measuring cavity [or lumen] detection means are placed, radioactive
- 100, line 6. holes (as viewed from the measuring cavity [or lumen]) detection means are placed,
- 100. lines 10-14. [-the pinholes are at least substantially arranged along a helix wherein the pitch of the helix is generally smaller than the distance between neighboring pinholes laying on the helix; and wherein the pitch of the helix is 0.03-0.98 and more preferably 0.05- 0.77 times the distance between neighboring pinholes laying on the helix].
--the pinholes are substantially arranged along a helix wherein the pitch of the helix is generally smaller than the distance between neighboring pinholes laying on the helix wherein the pitch of the helix is generally at least 1.03, at

least 1.05, at least 1.3, more specifically at least 2,
preferably at least 5 or more preferably at least 10 times
smaller than the distance between neighboring pinholes
laying along the helix.

Allowable Subject Matter

3. Claims 1,2,4-35,38-54,57-72,74 and 80-100 are allowed.

4. The following is an examiner's statement of reasons for allowance:

Regarding claim 1, the prior art does not disclose or fairly suggest a method of obtaining a tomographic image or part of an object (i.e. patient, animal), using radioactive radiation, comprising a cavity wall which is provided with a plurality of pinholes, wherein the pinholes are at least substantially arranged in a plurality of flat planes and the distance between neighboring planes is smaller than the distance between neighboring pinholes within such a plane wherein distance between neighboring planes is at least 1.03 or most preferably at least 10 times smaller than the distance between neighboring pinholes within any of such planes; or pinholes arranged along a helix wherein the pitch of the helix is generally smaller than the distance between neighboring pinholes laying on the helix wherein the pitch of the helix is generally at least 1.03 times smaller than the distance between neighboring pinholes laying along the helix.

The examiner notes, that while it is known in the art a method of obtaining a tomographic image or part of an object (i.e. patient, animal), using radioactive radiation, wherein the object is at least partly placed into a measuring cavity (30) having an axial

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axis (70), the measuring cavity being at least partially surrounded by a cavity wall which is provided with a plurality of pinholes (104n) (i.e. slits or gaps), and wherein behind the pin holes detection means are placed, radioactive radiation from a radioactive isotope (i.e. radiopharmaceuticals or radioisotopes) administered to the object is detected in a position-related manner by the detection means and data obtained with the detection means are used for the generation of the tomographic image (see *Zeng et al -- US 2003/0111609 A1*-- Figs. 1 and 11 and paragraphs [0036], [0066] and [0069]).

Pinholes (38)(40)(42) (i.e. openings) are at least substantially arranged along a helix wherein the pitch of the helix is generally smaller than the distance between neighboring pinholes laying on the helix (see *Genna et al -- US 5,021,667*-- Figs. 1 and 2 and col. 5, lines 8-26 and lines 53-60), the prior art does not fairly disclose distances between neighboring planes and neighboring pinholes or distances between a pitch of the helix and neighboring pinholes laying on the helix.

Regarding claim 2, the prior art does not disclose an apparatus for obtaining a tomographic image where the distance between neighboring planes is smaller than the distance between neighboring pinholes within such a plane wherein distance between neighboring planes is at least 1.03 times smaller than the distance between neighboring pinholes within any of such planes; or pinholes arranged along a helix wherein the pitch of the helix is generally smaller than the distance between neighboring pinholes laying on the helix wherein the pitch of the helix is generally at least 1.03 or most preferably at least 10 times smaller than the distance between neighboring pinholes laying along the helix.

The examiner notes, that while it is known in the art of an apparatus for obtaining a tomographic image of an object (i.e. patient, animal), using radioactive radiation, which apparatus comprises a measuring cavity having an axial axis (70), a cavity wall (30) which at least partly surrounds the measuring cavity which cavity wall is provided with a plurality of pinholes (104n) (i.e. slits or gaps), the apparatus further comprising detection means (22) which view from the cavity, are provided behind the pin holes (104n), wherein the detection means are arranged for receiving, in a position-related manner, the radioactive radiation emitted within the measuring cavity and wherein the detection means can be read electronically or optically (see *Zeng et al -- US 2003/0111609 A1*-- Figs. 1 and 11 and paragraphs [0036], [0066] and [0069]). Pinholes (38)(40)(42) (i.e. openings) are at least substantially arranged along a helix wherein the pitch of the helix is generally smaller than the distance between neighboring pinholes laying on the helix (see *Genna et al -- US 5,021,667*-- Figs. 1 and 2 and col. 5, lines 8-26 and lines 53-60), the prior art does not fairly disclose distances between neighboring planes and neighboring pinholes or distances between a pitch of the helix and neighboring pinholes laying on the helix.

Regarding claim 35, the prior art does not disclose or fairly suggest an apparatus for a tomographic image of an object (i.e. patient, animal), using radioactive radiation, wherein the cavity wall has a polygonal cross section in a direction perpendicular to the axial axis.

The examiner notes, that while it is known in the art of an apparatus for obtaining a tomographic image of an object (i.e. patient, animal), wherein the detection means,

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viewed from the cavity, are provided behind the pinholes, where the detection means are arranged for, in a position-dependent manner, the detection means can be read electronically or optically (see *Zeng et al -- US 2003/0111609 A1*-- Figs. 1 and 11 and paragraphs [0036], [0066] and [0069]), the prior art does not fairly disclose wherein the axial axis of the measuring cavity and wherein the cavity wall has a polygonal cross section in a direction perpendicular to the axial axis.

Regarding claim 44, the prior art does not disclose or fairly suggest an apparatus for a tomographic image of an object (i.e. patient, animal), using radioactive radiation, comprising blocking wall, wherein openings of the blocking wall have a surface which is greater than the surface of the pinholes.

The examiner notes, that while it is known in the art of an apparatus for obtaining a tomographic image of an object (i.e. patient, animal), comprising a blocking wall extending between the cavity wall and the detection means wherein the blocking wall comprises a plurality of openings for providing a passage for the radiation from the pinholes (104) to the detection means (22) laying within the limited solid angle (see *Zeng et al -- US 2003/0111609 A1*-- Fig. 11), the prior art does not fairly disclose wherein the openings of the blocking wall have a surface greater than the surface of the pinholes.

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Regarding claim 74, the prior art does not disclose or fairly suggest an apparatus for a tomographic image of an object (i.e. patient, animal), using radioactive radiation, wherein the pinholes are distributed over the wall of the measuring cavity such that for

two peripherally neighboring pinholes one axially neighboring pinhole is situated halfway $\pm 20\%$ between the two peripheral neighboring pinholes.

The examiner notes, that while it is known in the art of an apparatus for obtaining a tomographic image of an object (i.e. patient, animal), comprising baffles (300) oriented towards the lumen of the measuring cavity and mounted on, around, or up against the surface of the detection means (see *Zeng et al -- US 2003/0111609 A1--* Figs. 1 and 11) wherein the baffles are provided with projecting elements having a direction component parallel to the surface of the detection means (see *Zeng et al -- US 2003/0111609 A1--* Fig. 11), the prior art does not fairly disclose wherein the two peripherally neighboring pinholes one axially neighboring pinhole is situated halfway between two peripheral neighboring pinholes of $\pm 20\%$.

Regarding claim 96, the prior art does not disclose or fairly suggest an apparatus for a tomographic image of an object (i.e. patient, animal), using radioactive radiation, comprising blocking means wherein the radiation blocking means comprises baffles located outside of the measuring cavity.

The examiner notes, that while it is known in the art of an apparatus for obtaining a tomographic image of an object (i.e. patient, animal), comprising radiation blocking means (300) which partly block radiation which travels from the measuring cavity through at least one of the pinholes to the detection means such that the radiation which is detected by the detection means lays in a limited solid angle relative to the at least one pinhole, which angle is smaller than the solid angle which would have been obtained without the radiation blocking means (see *Zeng et al -- US 2003/0111609 A1--*

Fig. 11 and paragraph [0069]), the prior art does not fairly disclose wherein the radiation blocking means comprises baffles located outside the measuring cavity.

Regarding claims 97 and 98, the prior art does not disclose or fairly suggest an apparatus or method for obtaining a tomographic image or part of an object comprising a cavity wall, provided with a plurality of pinholes, wherein the pinholes arranged in a plurality of flat planes and wherein the distance between neighboring planes is 0.03-0.98 and more preferably 0.05-0.77 times the distance between neighboring pinholes within any of such planes.

The examiner notes, that while it is known in the art of an apparatus and method to obtain a tomographic image of an object (i.e. patient, animal), using radioactive radiation, which apparatus comprises a measuring cavity having an axial axis (70), a cavity wall (30) which at least partly surrounds the measuring cavity which cavity wall is provided with a plurality of pinholes (104n) (i.e. slits or gaps), the apparatus further comprising detection means (22) which view from the cavity, are provided behind the pin holes (104n), wherein the detection means are arranged for receiving, in a position-related manner, the radioactive radiation emitted within the measuring cavity and wherein the detection means can be read electronically or optically (see *Zeng et al -- US 2003/0111609 A1--* Figs. 1 and 11 and paragraphs [0036], [0066] and [0069]), the prior art does not fairly disclose distances between neighboring planes in a range of 0.03-0.98 or more preferably in a range of 0.05-0.77 times the distance between neighboring pinholes with any of such planes.

Regarding claim 99, the prior art does not disclose or fairly suggest a method of obtaining a tomographic image or part of an object (i.e. patient, animal), using radioactive radiation, comprising a cavity wall which is provided with a plurality of pinholes, wherein the pinholes are at least substantially arranged along a helix wherein the pitch of the helix is generally smaller than the distance between neighboring pinholes laying on the helix wherein the pitch of the helix is generally at least 1.03, at least 1.05, at least 1.3, more specifically at least 2, preferably at least 5 or more preferably at least 10 times smaller than the distance between neighboring pinholes laying along the helix.

The examiner notes, that while it is known in the art a method of obtaining a tomographic image or part of an object (i.e. patient, animal), using radioactive radiation, wherein the object is at least partly placed into a measuring cavity (30) having an axial axis (70), the measuring cavity being at least partially surrounded by a cavity wall which is provided with a plurality of pinholes (104n) (i.e. slits or gaps), and wherein behind the pin holes detection means are placed, radioactive radiation from a radioactive isotope (i.e. radiopharmaceuticals or radioisotopes) administered to the object is detected in a position-related manner by the detection means and data obtained with the detection means are used for the generation of the tomographic image (see *Zeng et al -- US 2003/0111609 A1*-- Figs. 1 and 11 and paragraphs [0036], [0066] and [0069]), the prior art does not fairly disclose distances between neighboring planes laying on a helix, wherein the pitch of the helix is in a range of 0.03-0.98 or more preferably in a range of 0.05-0.77 times the distance between neighboring pinholes laying on the helix.

Regarding claim 100, the prior art does not disclose or fairly suggest a method of obtaining a tomographic image of an object (i.e. patient, animal), using radioactive radiation, comprising a cavity wall which is provided with a plurality of pinholes, wherein the pinholes arranged along a helix wherein the pitch of the helix is generally smaller than the distance between neighboring pinholes laying on the helix wherein the pitch of the helix is generally at least 1.03 times smaller than the distance between neighboring pinholes laying along the helix.

The examiner notes, that while it is known in the art a method of obtaining a tomographic image or part of an object (i.e. patient, animal), using radioactive radiation, wherein the object is at least partly placed into a measuring cavity (30) having an axial axis (70), the measuring cavity being at least partially surrounded by a cavity wall which is provided with a plurality of pinholes (104n) (i.e. slits or gaps), and wherein behind the pin holes detection means are placed, radioactive radiation from a radioactive isotope (i.e. radiopharmaceuticals or radioisotopes) administered to the object is detected in a position-related manner by the detection means and data obtained with the detection means are used for the generation of the tomographic image (see *Zeng et al -- US 2003/0111609 A1*-- Figs. 1 and 11 and paragraphs [0036], [0066] and [0069]).

Pinholes (38)(40)(42) (i.e. openings) are at least substantially arranged along a helix wherein the pitch of the helix is generally smaller than the distance between neighboring pinholes laying on the helix (see *Genna et al -- US 5,021,667*-- Figs. 1 and 2 and col. 5, lines 8-26 and lines 53-60), the prior art does not fairly disclose distances between

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neighboring planes and neighboring pinholes or distances between a pitch of the helix and neighboring pinholes laying on the helix.

The remaining 4-34, 38-43, 45-54, 57-72, 80-95 are allowable based on their dependency.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Faye Boosalis whose telephone number is 571-272-2447. The examiner can normally be reached on Monday thru Friday from 7:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Porta can be reached on 571-272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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7. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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